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EXAMINER

HUNG, YUBIN

ART UNIT PAPER NUMBER

2625

DATE MAILED: 04/19/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/823,733

Applicant(s)

SCHWARTZ ET AL.

Examiner

Yubin Hung

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-110 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-9, 22-24, 31-33, 50-52 and 71-110 is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-21, 25-30 and 34-49, 53-70 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to because hand-written markups are present in may of the figures. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "705" has been used to designate both the link labeled "cleanup" and the block labeled "mask." A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 4--9, 19-24, 29-42, 48-55, 63 are objected to because of the following informalities:
 4. Claim 4, and similarly for claims 19, 29, 48 and therefore their respective dependent claims 5-9, 20-24, 30-42 and 49-55, recite the limitation "creating **at least one** data structure" in lines 1-2. However, their respective parents claim only recite "creating a data structure."

5. Claim 63 recites "refinement" in line 3. It should have been "refinement" and will be interpreted as such for examination purpose.

6. Claim 63 recites "of two" in line 2. It should have been "in two" and will be interpreted as such for examination purpose.

7. Claim 75 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 71, the parent of claim 75, recites "4x4 subregions," which is the limitation of claim 75, in line 6.

8. Appropriate correction is required.

Double Patenting

9. Applicant is advised that should claims 11, 38, 65-67 be found allowable, claims 13, 40 & 42 (both are duplicate of 38), 68-70, respectively, will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing,

despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

[Examiner's comment: It appears that claims 13, 40 and 42 were instead intended to be dependent on claim 12, 39 and 41, respectively.]

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 10-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

12. Claim 10, and similarly for claim 14, recite the limitation "the indication of each of run" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claims 11, 13 and 15, being their respective dependent claims, are similarly rejected.

[Examiner's comment: It appears that claims 10 and 14 were intended to be dependent on claim 6. See the equivalent claim, 37, for the cleanup pass.]

13. Claim 12 recites the limitation "indication of a number of coefficients to skip" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

[Examiner's comment: It appears that claim 12 was intended to be dependent on claim 6.]

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claims 1-4, 16-19, 25-29, 45-48, 56, 59-64 are rejected under 35 U.S.C. 102(b) as being anticipated by *JPEG 2000 Part I Final Committee Draft Version 1.0*, 16 March 2000 (hereinafter referred to as **JPEG2K**).

16. Regarding claims 1, and similarly claims 4, 26, 29, 59, 60, 63, 64, JPEG2K discloses

- performing a significance propagation pass on a group of coefficients [P. 94, lines 14-19]
- creating a data structure that indicates locations of coefficients in the group of coefficients that are to be processed in subsequent passes; [P. 93, D.3, lines 1-3; P. 94, lines 14-19; P. 96, D.3.3, line 2 (refinement pass); P. 97, D.3.4, lines 1-3 (cleanup pass). Note that the set of the binary state variables (i.e., significant states) constitutes the data structure. Further note that the values of the state variables change during the coding process (D.3, line 3). In addition, since only coefficients indicated by the data structure are selected for refinement (respectively, cleanup) processing, it is inherent that the data structure indicates the locations of those coefficients]
- performing a refinement sub-bitplane pass by accessing the data structure to obtain information to identify coefficients to be skipped for refinement (respectively, cleanup) sub-bitplane pass processing, and accessing a memory storing the group of coefficient using the information to only access coefficients identified as being in the refinement (respectively, cleanup) pass, and coding refinement (respectively, cleanup) bits accessed from the memory

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[P. 94, lines 14-19; P. 96, D.3.3, lines 1-2 (refinement pass); P. 97, D.3.4, lines 1-2 (cleanup pass). Note that storing the selected coefficients in and accessing them from a memory is an inherent step]

17. Regarding claims 2, and similarly claim 27, JPEG2K further discloses

- a plurality of refinement (respectively, cleanup) bits are accessed and non-refinement (respectively, non-cleanup) bits are ignored
[P. 94, lines 14-19; P. 96, D.3.3, lines 1-2 (refinement); P. 97, D.3.4, lines 1-2 (cleanup)]

18. Regarding claim 3, and similarly claim 28, JPEG2K further discloses

- the group of coefficients comprises a code-block
[P. 94, D.3, line 3]

19. Claims 16-19 are apparatus claims for rejected methods claims 1-4, respectively, and are similarly analyzed and rejected.

20. Claim 25 is a medium claim for rejected method claim 1 and is similarly analyzed and rejected.

21. Claims 45-48 are apparatus claims for rejected methods claims 26-29, respectively, and are similarly analyzed and rejected.

22. Claim 56 is a medium claim for rejected method claim 26 and is similarly analyzed and rejected.

23. Claims 61, 62 are apparatus claims for rejected method claims 59, 60 and are similarly analyzed and rejected.

Claim Rejections - 35 USC § 103

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

25. Claims 5, 20, 43, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over JPEG2K as applied to claims 1-4, 16-19, 25-29, 45-48, 56, 59-64 above, and further in view of Li (US 6,327,392).

26. Regarding claim 5, and similarly claim 43, JPEG2K discloses everything except the following:

- a first data structure is created for refinement bits and a second data structure is created for cleanup bits during the significance propagation pass

However, Li teaches the use of different lists (LIP, LSP and LIS) to indicate different types of coefficients [Col. 10, lines 41-51].

Li and JPEG2K are combinable because they are from the same field of endeavor of still image compression.

At the time of the invention, it would have been obvious to one of ordinary skilled in the art to modify JPEG2K with the teaching of Li by using separate data structures (one for refinement and another cleanup). The motivation would have been to reduce the size of the data since some coefficients (e.g., those just become significant in the immediately preceding significance propagation pass, see JPEG2K, P. 96, D3.3, lines 1-2) are neither processed in the refinement nor in the cleanup passes and therefore needed not be indicated by their respective data entries.

Therefore, it would have been obvious to combine Li with JPEG2K to obtain the invention as specified in claim 5 (and similarly claim 43).

27. Claim 20 is an apparatus claim for rejected method claim 5 and is similarly analyzed and rejected.

28. Regarding claim 44, JPEG2K further discloses

- the group of coefficients comprises a code-block [P. 94, D.3, line 3]

29. Claims 6, 10-15, 21, 30, 37-42, 49, 57, 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over JPEG2K as applied to claims 1-4, 16-19, 25-29, 45-48, 56, 59-64 above, and further in view of Lei (US 6,272,180).

30. Regarding claim 6, and similarly claim 30, JPEG2K discloses everything except the following:

- the data structure includes an indication of each run of refinement bits and the number of coefficients to skip in the group of coefficients before the next run of refinement bits

However, Lei teaches using run-length to encode runs of bits with identical value [Fig. 5, numeral 88; Col. 5, lines 62-65].

Lei and JPEG2K are combinable because they are from the same field of endeavor of compression.

At the time of the invention, it would have been obvious to one of ordinary skilled in the art to modify JPEG2K with the teaching of Lei by using un-length encoding to indicate each run of refinement bits and the number of coefficients to skip. The motivation would have been to reduce the size of the data since run-length encoding is a simple but an efficient way to represent runs of identical data.

Therefore, it would have been obvious to combine Lei with JPEG2K to obtain the invention as specified in claims 6 and 30, respectively.

31. Regarding claims 10-15 and similarly claims 37-42, JPEG2K and Lei disclose everything except the following:

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- (Claim 10.) The method defined in Claim 1 wherein the indication of each of run of refinement bits is stored as an integer
- (Claim 11.) The method defined in Claim 10 wherein the integer comprises a minimal size integer
- (Claim 12.) The method defined in Claim 1 wherein the indication of a number of coefficients to skip is stored as an integer
- (Claim 13.) The method defined in Claim 10 wherein the integer comprises a minimal size integer
- (Claim 14.) The method defined in Claim 1 wherein the indication of each of run of refinement bits and the number of coefficients to skip are stored as integers
- (Claim 15.) The method defined in Claim 14 wherein the integers comprise minimal size integers

However, it is well known in the art that integer data type is widely supported in computers and to use the minimal size integer to store values that by nature are of an integer type.

JPEG2K and Lei can be realizable in a stand-alone computer or an embedded processor.

At the time of the invention, it would have been obvious to one of ordinary skilled in the art to modify JPEG2K and Lei by storing the indications of the runs and the numbers of coefficients to skip (both are clearly of an integer type by nature) as a minimal size integer. The motivation would have been to make the method realizable in a wide array of computers (since, for example, if stored as a floating number, then the method may not be realizable in many simple processors that do not support floating arithmetic) as well as to minimize the storage requirement.

Therefore, it would have been obvious to use the well-known technique of using minimal size inter in combination with the combined invention of Lei and JPEG2K to obtain the inventions as specified in claims 10-15 and 37-42.

32. Claim 21 is an apparatus claim for rejected method claim 6 and is similarly analyzed and rejected.

33. Claim 49 is an apparatus claim for rejected method claim 30 and is similarly analyzed and rejected.

34. Regarding claim 57, the analyses for claims 1, 6, 26, 30 above discuss how all its limitations, with the exception of the use of a context model accessing a memory, are anticipated or suggested by JPEG2K and Lei.

Regarding the use of a context model accessing a memory, JPEG2K discloses the use of a context model [P. 94-97] and Lei discloses the use of a memory to store data that are needed in the process [Fig. 4, numeral 74].

JPEG2K and Lei do not expressly disclose that the data structure(s) for the refinement and the cleanup bit counts and skip counts are stored in the memory for access by the context model.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to store the data structure(s) for the refinement and the cleanup bit counts and skip counts in the memory for access by the context model. The motivation would have been to eliminate the need to obtain data from a secondary storage such as a hard disk which has a much longer access time than a memory.

Therefore, it would have been obvious to store the data structure(s) for the refinement and the cleanup bit counts and skip counts in the memory for access by the context model to obtain the invention as specified in claim 57.

35. Claim 58 is an apparatus claim for rejected method claim 57 and is similarly analyzed and rejected.

36. Claims 34-36, 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over JPEG2K and Lei (US 6,272,180) as applied to claims 6, 30 above, further in view of Miyashita et al. (US 5,754,696).

37. Regarding claims 34-36, JPEG2K and Lei disclose everything except the following:

- (Claim 34.) The method defined in Claim 30 wherein the indication of each of run of cleanup bits is represented with a variable length code
- (Claim 35.) The method defined in Claim 30 wherein the indication of a number of coefficients to skip is represented with a variable length code

- (Claim 36.) The method defined in Claim 30 wherein the indication of each of run of cleanup bits and the number of coefficients to skip are represented with variable length codes

However, Miyashita et al. teaches the use of variable length codes [Fig. 1, numeral 155; Col. 9, lines 10-12].

Miyashita et al., JPEG2K and Lei are combinable because they are from the same field of endeavor of still image compression.

At the time of the invention, it would have been obvious to one of ordinary skilled in the art to modify JPEG2K and Lei by encoding the indications of the runs and the numbers of coefficients to skip with variable length code. The motivation would have been to reduce the data size using a proven and effective encoding method that in turn will lower the storage requirement.

Therefore, it would have been obvious to combine Miyashita et al. with Lei and JPEG2K to obtain the inventions as specified in claims 34-36.

38. Claims 53-55 are an apparatus claim for rejected method claims 34-36 and are similarly analyzed and rejected.

39. Claims 65, 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jan (US 5,363,097), in view of Lindenstruth (US 6,067,595).

40. Regarding claim 65, and similarly claim 68, Jan discloses:

- a memory to store run counts and skip counts [Fig. 2, numeral 52; Col. 3, lines 28-33]
- decoding hardware coupled to the memory to decode a run count and a skip count obtained from the memory [Fig. 2, numeral 54; Col. 3, lines 28-33. Note that the VLD can decode (variable-length encoded) run count and skip count if they are the data accessed from the memory]

Jan neither expressly discloses that the counts are stored in two distinct portions of the memory separated by a third portion nor that they are accessed from the memory simultaneously.

However, Lindenstruth teaches storing data in different portions of a multi-port memory that are separated by other portion(s) that can be accessed by multiple processors simultaneously. [Fig. 3, numerals 32', 34, 34'; Col. 15, lines 57-65. Note that Fig. 3, numeral 32' shows a 4-port memory. Therefore processors 34 and 34' each accesses its respective data, say, run count and skip count, from respective portions of the memory associated with their respective port. The other two portions of the memory separate the portions for run counts and skip counts]

Lindenstruth and Jan are combinable because they have aspects that are from the same field of endeavor of computer memory.

At the time of the invention, it would have been obvious to one of ordinary skilled in the art to modify Jan with the teaching of Lindenstruth by storing different types of data (such as run counts and skip counts) in different portions of a multi-port memory that are accessed by multiple processors (such as decoders) simultaneously. The motivation would have been to be able to perform parallel processing in order to increase the system throughput.

Therefore, it would have been obvious to combine Lindenstruth with Jan to obtain the inventions as specified in claim 65.

41. Claims 66-67 and 69-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jan (US 5,363,097) and Lindenstruth (US 6,067,595) as applied to claim 65, further in view of Yamashita et al. (US 6,377,979).

42. Regarding claims 66-67, and similarly claim 69-70, Jan and Lindenstruth disclose everything except the following:

- (Claim 66.) The apparatus defined in Claim 65 wherein the third portion of the memory comprises an unused portion of memory between the two portions of memory.
- (Claim 67.) The apparatus defined in Claim 66 wherein the unused portion of memory is adjacent to the two portions of memory

Note that per the analysis for claim 65, it is clear that in the case of a dual-port memory, the third portion will comprise the unused portion of the memory between the two other (used) portions and will be adjacent to them.

While Jan and Lindenstruth do not expressly disclose the use of a dual-port memory, Yamashita et al. in [Fig. 2, numeral 20; Col. 3, lines 23-35] teaches the use of one.

Yamashita et al., Lindenstruth and Jan are combinable because they have aspects that are from the same field of endeavor of computer memory.

At the time of the invention, it would have been obvious to one of ordinary skilled in the art to modify Jan and Lindenstruth with the teaching of Yamashita et al. by a dual-port memory. The motivation would have been to be able to perform parallel processing in order to increase the system throughput without using memory with more ports than are needed to save cost.

Therefore, it would have been obvious to combine Yamashita et al. with Lindenstruth and Jan to obtain the inventions as specified in claim 66-67.

Allowable Subject Matter

43. Claims 7-9, 22-24, 31-33, 50-52, 71-110 are allowed.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (703) 305-1896. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yubin Hung
Patent Examiner
April 14, 2004


TIMOTHY M. JOHNSON
PRIMARY EXAMINER